

4. DESCRIPTIONS OF NEW SPECIES AND VARIETIES OF CHITONIDÆ
AND ACMÆIDÆ, FROM THE PANAMA COLLECTION OF THE
LATE PROF. C. B. ADAMS. BY PHILIP P. CARPENTER, B.A.,
PH.D.

LEPIDOLEURUS ADAMSII.

L. t. "L. dispari" simili; pallide rufo-fusca, colore intensiore irregulariter strigata seu maculata; saepius maculis albidis regione diagonali ornata; jugo vix acuto; areis centralibus et valvis terminalibus conspicue granulosis; areis lateralibus irregulariter verrucosis, verrucis plerumque lobatis; mucrone antico, vix conspicuo: intus, valvis centralibus uni-, terminalibus viii.-x.-fissis; subgrundis parvis, dentibus acutis; suturis medianis postice rectis, antice laminas haud attingentibus, sinu planato, latissimo: limbo pallii imbricatim squamoso.

Long. ·6, lat. ·3 poll.; div. 11°.

Variat verrucis minus expressis, simplicioribus.

= *Chiton dispar*, C. B. Ad. no. 373, par.

= *Lophyrus adamsii*, P. Z. S., 1863, p. 24.

Unfortunately for those who do not like to remove the non-testaceous portion from their Chitons, as they do from their other shells, the mantle-margin by no means affords a safe clue to the structure of the valves. Among the species of the genus *Ischnochiton*, Gray,

223. The length should be 1·1.
 319. For "labio nullo" read "tenuissimo."
 320. The nuclear shell has two whorls, *Ampullaria*-shaped.
 367. Add to diagnosis, "operculo concavo, linea elevata suturam definiente."
 368. Add to diagnosis, "operculo vix concavo, suturis minus definitis."
 373. Add to diagnosis, "operculo concavo, suturis distinctis, peripheriam versus linea elevata instructis." The species was found living among the small *Olivellæ*.
 376. Add to diagnosis, "operculo concavo, suturis vix definitis." Living, among *Olivellæ*.
 501. Instead of the specimen from which the description in the text was written, tablet 1966 contains a much finer shell, since found, which allows of the following addition to the diagnosis:—"vert. nucl. parvo, satis extante, decliviter sito; anfr. norm. v.; interstitiis carinarum transversim rugulosis; labro solidiore. Long. ·087, long. spir. ·057, lat. ·038."
 510. A very beautiful shell, found in the refuse of Professor Adams's Panama collection, is probably of this species, though the sutural cancellations are close. It has one more whorl: vertex Chemnitzoid, of three Helicoid whorls, scarcely projecting; apex hidden.
 650. From perfect Cape St. Iueas specimens, add the following to diagnosis:—"epidermide fimbriata, lirulas spirales eleganter decussante."
 Page 312. Add to the diagnoses of opercula of *Vermetidæ*:—
 "(h.) Operculum corneum, intus convexum, nitidum, umbone magno extante; extus concavum, paucispirale, lamina extante suturas definiente. Diam. ·045." Tablet 2537 contains the only specimen found, resembling *Siphonium*, from the *Spondylus*-washings.
 Tablet 447 is *Lioecardium apicinum*, which should stand as species 709.
 Page 314, note * (*et seq.*), for "Inflatulum" read "Mioceras."
 Page 359, line 18, for "regular" read "irregular."

(=*Lepidopleurus*, Add.,) known by the sharp incisor-teeth lying within a projecting lip, there are three types of mantle-margin, which may be conveniently separated as subgenera, to aid in the difficult task of describing and identifying species. The typical forms, for which the name *Ischnochiton* should be retained, have the scales somewhat chaffy, and very finely striated. *I. magdalensis* and *I. sanguineus* well represent the group. But another series have the mantle-scales imbricate and strong, as in *Chiton*, Gray, (=*Lophyrus*, Add.,) from which they cannot be distinguished without dissection. For this Messrs. Adams's name *Lepidopleurus* may be retained in a restricted sense. It is uncertain what Risso's original genus was meant to include: his diagnosis applies to all Chitons with distinct side-areas and scaly margins.

A third group, separated by Dr. Gray in his 'Guide,' p. 182, as having the "mantle-scales minute, granular," has been named *Trahydermon*: it abounds in the Californian region.

The specimens of *L. adamsii* were found among the duplicates named *Chiton dispar* by the Professor; one was attached to *Discina cumingii*.

LEPIDOPLEURUS TENUISULPTUS.

L. t. "L. adamsii" simili; olivacea, colore pallido seu intensiore minute variegata; tota superficie minute granulosa; areis lateralibus vix definitis; suturis plerumque albido maculatis; mucrone antico, satis conspicuo, parte postica concava: intus, ut in "L. adamsii" formata.

Variat: *t. pallidore, ad jugum rufo-tincta.*

=*Chiton dispar*, C. B. Ad. no. 373, pars.

The outside of this shell so much resembles the young of *Chiton (Lophyrus) stokesii*, that specimens may have been distributed under that name. Very few individuals were found.

ISCHNOCHITON ELENENSIS (diagn. auct.).

Extus areis centralibus clathris parallelis circ. xx. decussatis; ar. lat. costis ii., validioribus, tumidis, tuberculosis: intus marginibus suturalibus posticis reflexis, tuberculatis, sinu ad jugum parvo; laminis insertionis unifissis, ad laminas suturales anticas junctis, sinu latissimo. Valva antica extus costis xii., haud validis; intus fissuris x., dentibus acutis, subgrunda parva. Valva postica mucrone subpostico, depresso; parte postica expansa, concava, costis circ. xi. subobsoletis; intus lamina insertionis circ. ix.-fissa, dentibus curtis, subgrunda parva, intus callosa.

The central valves in this species are normal; but the posterior valve offers a transition towards *Callochiton*, the outside being concave posteriorly, the insertion-teeth short and the eaves callous.

ISCHNOCHITON (? var.) EXPRESSUS.

I. t. "I. elenensi" simili, sed carnea; areis centr. clathris x.,

distantibus, crebre decussatis, jugo acuto; ar. lat. costis ii., validissimis, angustis, tuberculis angustis: intus marginibus suturalibus posticis planatis, haud tuberculosis, haud sinuatis; lam. insert. ut antea, sinu angusto, ad jugum angulato. *Valva antica costis x., validis, angustis: intus ut antea, sed fissuris viii. Valva postica mucrone postico, planato; parte postica expansa, haud concava, costis circ. vii. validissimis: intus lamina circ. vii.-fissa, subgrunda planata.*

With a strong general resemblance to *I. elenensis*, the differences in detail in the only two specimens examined, as above stated, appear of specific importance. If only varietal, it is equally important to notice how much change is tolerated by the habits of the animal. It may be the shell called *Chiton clathratus* by Prof. Adams, of which there were no duplicates to compare. It offers a still more marked transition to *Cullochiton*, the margin of the posterior valve being somewhat pectinated by the great projection of the ribs.

"CULLOCHITON" PULCELLUS: diagn. auct.

Extus areis centr. linea interdum parallelis, interdum radian-tibus, rugose scrobiculatis; ar. lat. costis ii., validissimis, im-bricato-nodosis: valva antica costis similibus circ. ix.: v. post. area centrali lata; mucrone subpostico, planato; parte postica costis vii. similibus, medianis curtissimis, excurratis: pallio squamulis minutis imbricatis. Intus v. ant. subgrunda (ut in Ischnochitone) munita, sed a costis pectinata; dentibus acutis, intus linea undulata secundum costas instructa, extus concavis, parte convexa costarum incisis: v. medianis similiter pectinatis, laminis secundum costas diag. uniscisis: laminis suturalibus medio continuis, late sinuatis; suturis posticis a sculptura externa granulatis: v. post. vii.-lobata, marginibus planatis, laminis dense compressis incrassatis; dentibus obtusissimis, appressis, haud extantibus, subobsoletis, extrorsum planatis, ut in v. aut. fissis; interdum fissuris quoque in partibus concavis.

As I have seen no published diagnosis of the very peculiar type of insertion-plates observed in this species, which has hitherto been too rare to allow working naturalists an opportunity of dissection, I have given a minute description. The plates of insertion, as well as the exterior eaves, are scalloped by the strong ribs, and alternate with them. In the posterior valve the caves are flattened outwards, in closely appressed layers, the blunt, ill-developed insertion-teeth lying flat upon them. The valves easily separate from the mantle, when immersed in water. Outside, the species is easily recognized by the two strong ribs of the diagonal areas, the central pitted in somewhat branching rows, and the ribs on the curiously flattened posterior valve resembling a clenched fist.

ACMÆA (? FLOCCATA, var.) FILOSA.

A. t. "A. mesoleucæ" forma et inde simili; sed sculptura multo

tenuiore; t. jun. lœvi; dein lirulis delicatulis, acutis, haud granulosis, valde distantibus, interdum obsoletis, filosa; interstitiis latis, lœvibus; tenui, planatu, ovali, subdiaphana; nigro-fusco, corneo radiatim strigata, seu varie maculata: intus livida seu albida, coloribus externis transeuntibus; limbo lato, acuto.

Long. '7, lat. '56, alt. '12.

=*Lottia* ? *patina*, C. B. Ad. Pan. Shells, no. 367.

Hab. Panama (*C. B. Adams*).

There is no described west-tropical species to which these shells can be affiliated, unless they prove to be a very delicate variety of *A. floccata*, Rve. Unfortunately the Panama limpets have never been collected in sufficient numbers to make out their specific limits satisfactorily. The names here given may stand as species or varieties, according to future elucidation. In shape and texture, but not in colour or sculpture, these shells resemble *A. fascicularis*; in the latter respects, *A. strigatella*. They were named " *tenera*, Ad." by Dr. Dohrn, but are sufficiently distinct from that West-Indian species.

ACMÆA (? FLOCCATA, var.) SUBROTUNDA.

A. t. "A. var. filosæ" simili, sed subrotundata, magis elevata, vertice subcentrali; colore intensiore, lineis cornicis crebrioribus, angustis; t. jun. saepe pallidore, radiis duobus postice triangulata: intus callo livido, tenuiore.

Long. '53, lat. '45, alt. '15.

=*Lottia*, sp. ind. *a*, C. B. Ad. Pan. Shells, no. 368.

Hab. Panama (*C. B. Adams*).

ACMÆA (? var.) VERNICOSA.

A. t. parva, subrotundata, depresso-conica, apice ad duas quintas partes sito; albido-viridi, strigis paucis rufo-fuscis hic et illic ornata, saepius radiis duobus candidis, postice triangulata; extus lineis acutis radiantibus, valde distantibus, saepe obsoletis vix sculpta: intus livida, callosa, saepius spathula candida ornata; basi subplanata, limbo angusto.

Long. '3, lat. '24, alt. '1.

Hab. Panama (*Jewett, C. B. Adams*).

=*Lottia*, sp. ind. *b*, C. B. Ad. Pan. Shells, no. 369.

Had this form been brought from the China Seas, it might have been taken for the young of *A. biradiata*, Rve. From its solidity, however, its rough exterior, and its callous interior, it appears to be adult. It is barely possible that it may develop into *A. vespertina*. It differs from the young of *A. subrotundata* in being much thicker and less spotted with the green tint.